TELEPHONE HYBRID-1

USER MANUAL

V.1.02

Smart in Solutions

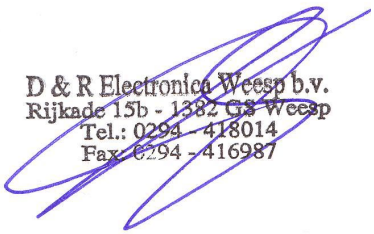
Dear Customer,

Thank you for choosing the Telephone Hybrid-1.

This time you are not faced with a huge manual because it is simply not necessary because of the natural recognition of all functions on the user interface.
All functions are self-explanatory and you will certainly appreciate the ergonomics of this design.

We are confident that you will be using the Telephone Hybrid-1 for many years to come, and wish you a lot of success.

With kind regards,



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What is a Telephone hybrid?

Telephone hybrids provide the interface between professional audio equipment and the public telephone network. They provide protection for your equipment and the public telephone lines, allowing for varying line signals and line conditions. Automatically canceling out the unwanted signal they also facilitate two-way communication down a single telephone line.

Each hybrid has a telephone line connection, a handset connection and separate connectors for audio input and output from a broadcast mixer, or other professional audio source.

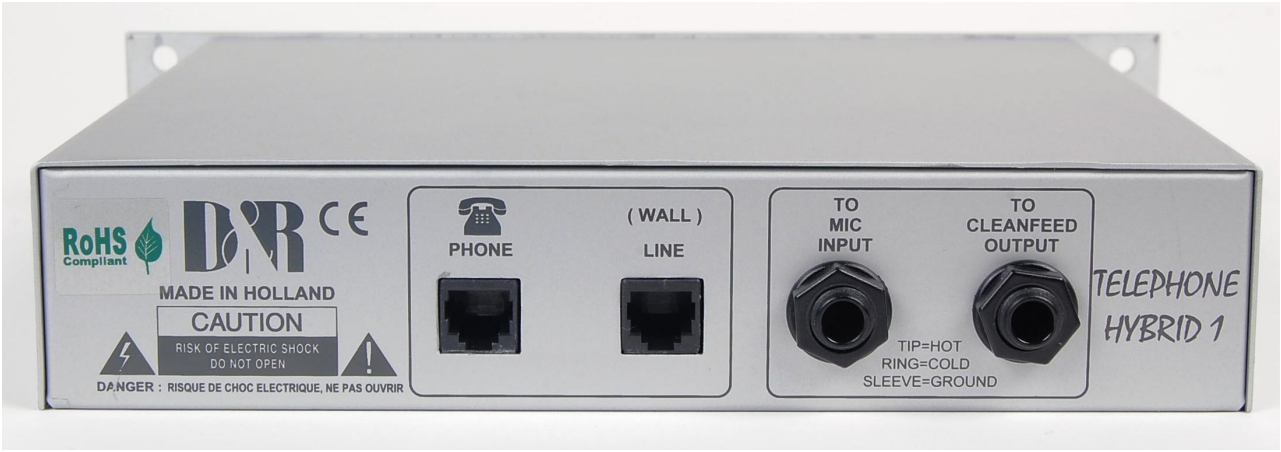
A large proportion of D&R hybrids are used in radio and television broadcasting applications allowing external callers to be connected to the studio mixing console. Most of the other units are supplied to communication operations allowing extremely effective conversion between 4-wire audio circuits and standard telephone lines.

Specs:
Output: balanced mic level - 30db.
Input: Line level 0 dBu balanced.
R/C balance: fully adjustable
Separation: more than 30db.

Front panel lay-out

C-BALANCE	12 pole rotary switch to select the optimum side tone attenuation.
R-BALANCE	Internal potentiometer to adjust for optimum side tone attenuation.
TO CALLER	Switch to temporarily connect the line (wall) connector to the Phone connector (appliance) to be able to dial and make a connection.
ON-LINE CONNECT	Line connect switch to connect and disconnect calls from the telephone line.

Back panel lay-out



PHONE:	RJ-11 connector to connect with a handset.
LINE (wall)	RJ-11 connector to connect with the public telephone network.
TO MIC INPUT	Stereo jack output to be connected to Mic input of the mixer.
TO CLEANFEED OPUTPUT	Stereo jack input to be connected to Mix Minus/Clean feed (N-1)output of the mixer.

USER MANUAL

The D&R Telephone Hybrid-1 is designed to create an easy connection between the public telephone line and your studio equipment.
The Hybrid has to be inserted between your telephone and the telephone line. Connect the two wires of the telephone line's wall unit to the RJ-11 connector labeled LINE (wall) and connect the telephone appliance itself to the Hybrid's phone output on the RJ-11 connector labeled PHONE. This can be done with standard available cable assemblies from your local phone shop.

Now the Hybrid is interfaced (fully balanced) between your telephone appliance and its connection to the outside world. The hybrid can now split the send and return signals.

Now connect the hybrid's balanced audio input labeled **TO CLEANFEED OUTPUT** to a (preferable) balanced output of around +4dBu. This output has to be the mix of all signals except the signal coming from the hybrid itself to avoid feedback.
An Aux. output on your mixer will do as well as long as you keep the Aux. send of the channel you return the phone signal on closed (all other Aux. sends need to be open), or in broadcast mixers a clean-feed is the best.

The Hybrid-1 stereo jack connector labeled **TO MIC INPUT** has to be connected to a Mic level input of your mixing console.

NOTE: The output of the Hybrid has to be connected to a Mic input of the mixing console, because the outgoing level is very low because of the passive circuitry inside the Hybrid.

WIRING SCHEME

PHONE:	RJ-11 connector to connect with a handset.
LINE (wall)	RJ-11 connector to connect with the public telephone network.
TO MIC INPUT	Stereo jack output to be connected to mic input of the mixer.
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CONNECTION WIRING OF BOTH PHONE AND LINE RJ-11 CONNECTORS

PHONE/WALL RJ-11	**FUNCTION**	**CONNECTION**
Pin 1	n.c.	
Pin 2	A (telephone line)	In/out
Pin 3	B (telephone line)	In/out
Pin 4	n.c.	

WIRING OF AUDIO IN AND OUTPUTS

STEREO JACK TO MIC INPUT / TOCLEANFEED OUTUT	TYPE	CONNECTION
Screen	Screen (ground)	Audio ground
Tip	Phase (hot)	Audio +
Ring	Non-phase (cold)	Audio -

SPECIFICATIONS

Audio Inputs

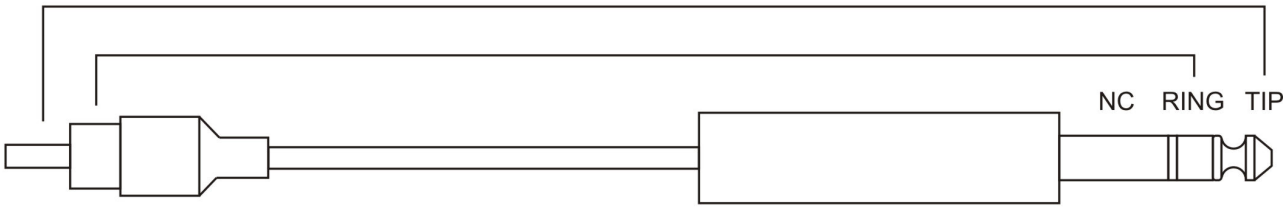
TO CLEANFEED OUTPUT	
Impedance	10k Ohm, electronically balanced
Common mode rejection	>30dB
Maximum input level	+26dBu
Nominal input level	+4 dBu
Frequency response	20Hz – 15kHz
Connectors	STEREO JACK

TO MIC INPUT	
Impedance	< 50 Ohm, electronically balanced
Common mode rejection	>30dB
Maximum output level	-20dBu
Nominal output level	+4 dBu
Bandwidth to telephone line	250Hz – 4kHz, -3dB ref 1 kHz
Telephone line impedance	Nominally 600 ohm
Telephone line impedance range	300 ohm to 1500 ohm
Connectors	STEREO JACK
GENERAL	
Distortion	Less than 0.1% (0dBu out)
Power supply	PASSIVE
Power consomption	NONE
Dimensions	1 HE front panel: 482x44mm
	Frame: 240x44x175mm (width x height x depth)
Weight	1.5 kg net including packing

AUDIO CONNECIONS TELEPHONE HYBRID TO OUR AIRMATE OR ANY MIXER

AIRMATE

TELEPHONE HYBRID



Cinch connector
Left cleanfeed output

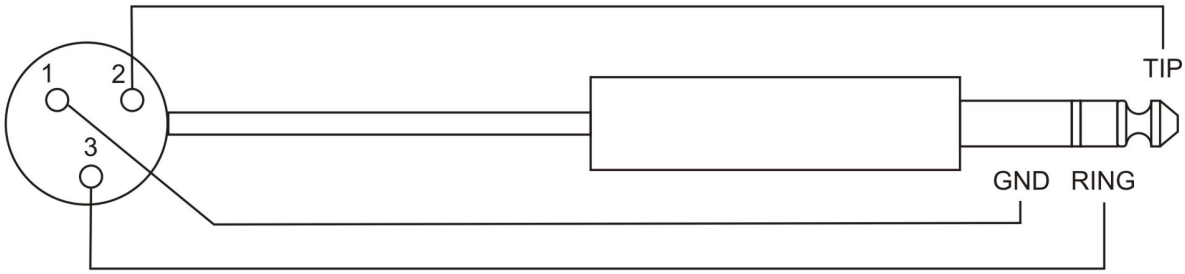
Jack connector
Cleanfeed input

Tip = Hot
Ring = Colt
Shield = Not connected

Cleanfeed output could also be an AUX send output!

AIRMATE channel 8

TELEPHONE HYBRID



XLR connector
Microphone input

1 = Ground
2 = Hot
3 = Cold

Jack connector
Hybrid mic. level output

Tip = Hot
Ring = Colt
Shield = Ground

SETTING UP PROCEDURE

Push the "to caller" switch and leave the "connect" switch in the up position. Now dial the caller to whom you want to talk. If this connection is made you connect the caller to the mixing console by pushing the connect switch.
Now listen by means of a PFL (CUE) switch on your mixer to the caller and adjust while talking the C and R balance so that the outgoing signal (your voice) is best attenuated.

A practical start is to put the C balance on number 7 and the R balance on 5. Carefully adjusting afterwards can be realized by slowly adjusting the R balance for optimum attenuation. This is the basic setting for most of your calls, because the line balancing to your own telephone station has to be performed one time only, when no changes are made to the telephone system in your place. The maximum attenuation will be around 22 to 26 dB.

The function of the "Connect" switch is to connect the hybrid to the telephone line instead of the phone itself (which is now switched off). The led indicates that a connection has been made.

The function "to caller" is there to disconnect the outgoing signal to the caller for private discussions

Declaration of Conformity
volgens ISO/IEC leidraad 22 en EN 45014

Name Manufacturer	**D&R Electronica Weesp b.v.**
Address Manufacturer	**Rijnkade 15B, 1382 GS Weesp, The Netherlands**

declares that the product

Name product	**TELEPHONE HYBRID-1**
Model nummer	**HYBRID**
Product options	**All**

Complies with the following product specifications:

Security	**EN 60950: 1988 +A1, A2**
EMC:	**CISPR-22: 1985 / EN 55022: 1988 klasse B (*) EN 50082-1: 1992 IEC 801-2:1991 / prEN 55024-2:1992 - 3kV CD, 8kV AD IEC 801-3:1984 / prEN 55024-3:1991 - 3 V/m IEC 801-4:1988 / prEN 55024-4:1992 - 0.5kV signal cables, 1 kV power cables.**

Additional info:

The product complies herewith to the following rules

Low voltage 73 / 23 / EEG
EMC-rules 89 / 336 / EEG.

(*) The product has been tested in normal users conditions.

PRODUCT SAFETY

This product is manufactured with the highest standards and is double checked in our quality control department for reliability in the "HIGH VOLTAGE" section.

CAUTION

Never remove any panels, or open this equipment. No user serviceable parts inside. Equipment power supply must be grounded at all times.
Only use this product as described, in user manual or brochure.
Do not operate this equipment in high humidity or expose it to water or other liquids. Check the AC power supply cable to assure secure contact.
Have your equipment checked yearly by a qualified dealer service center.
Hazardous electrical shock can be avoided by carefully following the above rules.

PLEASE READ THE FOLLOWING INFORMATION

Especially in sound equipment on stage the following information is essential to know.
An electrical shock is caused by voltage and current, actually it is the current that causes the shock. In practice the higher the voltage the higher the current will be and the higher the shock. But there is another thing to consider and it is resistance.
When the resistance in Ohms is high between two poles, the current will be low and vice versa. All three of these; voltage, current. and resistance are important in determining the effect of an electrical shock.
However, the severity of a shock primarily determined by the amount of current flowing through a person.
A person can feel a shock because the muscles in a body respond to electrical current and because the heart is a muscle it can affect, when the current is high enough.
Current can also be fatal when it causes the chest muscles to contract and stop breathing. At what potential is current dangerous. Well the first feeling of current is a tingle at 0.001 Amp of current. The current between 0.1 Amp and 0.2 Amp is fatal.
Imagine that your home fuses of 20 Amp can handle 200 times more current than is necessary to kill. How does resistance affect the shock a person feels.
A typical resistance between one hand to the other in "dry" condition could well over 100,000 Ohm.

If you are playing on stage your body is perspiring extensively and your body resistance is lowered by more than 50%. This is a situation in which current can easily flow.
Current will flow when there is a difference in ground potential between equipment on stage and in the P.A. system. Please do check if there is any potential between the housing of the mikes and the guitar synth amps, which will be linked by your body on stage. Imagine, a guitar in your hand and your lips close to the mike! A ground potential difference of above 10 volts is not unusual, in improperly wired buildings it can possibly be as high as 240 volts.

Although removing the ground wire sometimes cures a system hum, it will create a very hazardous situation for the performing musician.
Always earth all your equipment by the grounding pin in your mains plug.
Hum loops should be only cured by proper wiring and isolation input/output transformers.

Replace fuses always with the same type and rating after the equipment has been turned off and unplugged.
If the fuse blows again you have an equipment failure, do not use it again and return it to your dealer for repair.

And last but not least be careful not to touch a person being shocked as you, yourself could also be shocked.
Once removed from the shock, have someone send for medical help immediately

Always keep the above mentioned information in mind when using electrically powered equipment.

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TELEPHONE HYBRID

SERVICE MANUAL

Date: 18-08-9918-08-99 [[16:1716:17]] B I L L O F M A T E R I A L

D & R Electronica Weesp BV (SERVICE-MANUAL)
Comp: 100 60898508 Telephone Hybrid-1e 9.5"

Articlecode	Description	Quantity	Unit
10250345	Bridge rectifier B80C1000 (round)	1.0000	st
10400233	Condensator ker 560p R2.5	1.0000	st
10400234	Condensator ker 680p R2.5	1.0000	st
10400235	Condensator ker 820p R2.5	1.0000	st
10401246	Condensator poly 1n0 R5.0	1.0000	st
10401247	Condensator poly 1n5 R5.0	1.0000	st
10401248	Condensator poly 2n2 R5.0	1.0000	st
10401249	Condensator poly 3n3 R5.0	1.0000	st
10401250	Condensator poly 4n7 R5.0	1.0000	st
10401251	Condensator poly 6n8 R5.0	1.0000	st
10400278	Condensator poly 8n2 R5.0	2.0000	st
10401253	Condensator poly 10n R5.0	1.0000	st
10400273	Condensator poly 12n R5.0	1.0000	st
10401263	Condensator poly 180n R5.0	1.0000	st
10400280	Elco 2.2uF / 50V radiaal R5.0	1.0000	st
10400293	Elco 220uF / 63V radiaal R5.0	2.0000	st
10400281	Elco 4.7uF / 50V radiaal R5.0	1.0000	st
10600432	Jack chassis break	2.0000	st
10600445	Conn Chass 805-D 4p (RJ11)	2.000	st
10300791	Potm 12 1x1KA lin	1.0000	st
10200530	PCB Telephone-hybrid-C	1.0000	st
10550400	Switch Alps 2p-ns (2 x om)	1.0000	st
10550963	Switch Alps 4p-sh (4 x om)	1.0000	st
10550315	Switch rotary 1 x 12	1.0000	st
10950018	Transformer LM-NP-1003-B (PTT line)	2.0000	st
10350517	Resistor 0E 5% 1/4W	1.0000	st
10350718	Resistor 120E 5% 1/4W	1.0000	st
10350792	Resistor 604E 1% 1/4W	2.0000	st
10350728	Resistor 820E 5% 1/4W	1.0000	st
10250351	Zenerdiode 5V6 / 400mW	2.0000	st
10700631	Cap 11.0mm rond zwart	1.0000	st
10700665	cap 14.7mm (12.7x11.3)gat	1.0000	st
10450195	cap SiFam 11mm gray bulk	2.0000	st
10700975	Tape 12mm dun	20.0000	cm
10100371	Front 9.5" Telephonehybrid/E	1.0000	st
10500084	Isolation panel 9.5" randapp.PVC	1.000	st
10600436	Jack Nut	4.0000	st
10700685	Washer M 10 potmeter dun	2.0000	st
10150093	Frame 9.5" 1HE version D	1.0000	st
10450253	Knob Pushbutton 3.3 grey-square	2.0000	st
10450104	Knop SiFam grey D-shaft(11mm)	2.0000	st
10250387	Led 3mm red SLR-03A510-020	1.0000	st
20850531	PCB inserted Telephonehybrid	1.0000	st

Articlecode	Description	Quantity	Unit
10700790	Taptite M3x6 verzkop/pozidr/zw	4.0000	st
10800924	Packaging 9.5"	1.0000	st
10800956	Foamblock 9.5"	2.0000	st